

Next, a braided conductor 96 is wound around the mandrel 92 and the ferrite rods 90, with an insulating tape 93 disposed between the ferrite rods 90 and braided conductor 96 to provide electrical insulation.

Next, the D-shaped mandrel 92 is removed, leaving the structure shown in Figure 12.

Finally, the former is bent into a circular shape as shown in Figure 13. The ferrite conductors are arranged along the axis of the cylinder that is obtained by bending the rubber form sheet into a cylinder, and so are not bent. However, the braided conductor 96 that has been wrapped around the rubber form sheet is bent into a "horse-shoe"-shaped winding as a result of bending the former.

The rubber form sheet of McGaffigan does act, in combination with the mandrel 92, as a former during the process of winding the braided conductor. However, claim 1 of the present application requires the step of disposing at least one hard-wire electrical conductor around a **curved** former. This is simply not disclosed in McGaffigan. There is no step in McGaffigan of disposing a conductor around a curved former – the braid is disposed around the form sheet 94 while the form sheet is **flat**, and the form sheet is **subsequently** bent into a curved shape. Similarly, the ferrite rods are disposed on the form sheet while it is **flat**. There is no disclosure in McGaffigan of the step of disposing an electrical conductor around a curved former, as is recited in claim 1.

Moreover, the braided conductor disclosed in McGaffigan does not constitute a "hard-wire electrical conductor" as required by claim 1. The term "hard-wire" electrical conductor indicates a more rigid conductor than a braided conductor, such as a metallic bar or large-diameter metallic wire. The method of McGaffigan clearly requests that the conductor 96 can bend when the rubber form sheet 94 is bent, so that the conductor can adopt the curved cross-section of the form sheet. As a result, the method of winding the conductor around a flat former and subsequently bending both the former and the conductor into a curved shape is suitable only for use with very thin conductors. In contrast, the present invention relates to winding a hard-wire conductor around a former that has already been bent into a curved shape, and this is a completely different approach.

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Furthermore, McGaffigan does not disclose a **method of manufacturing "a coil for a magnet"** as required by claim 1 of the present application. McGaffigan is directed to manufacturing a "wrap-around induction heating tool" – see column 1, lines 10-11 – and this is not a magnet.

With regard to claim 12, McGaffigan discloses use of silicone rubber for the form 94. This appears to be a resilient material, so that McGaffigan possibly does disclose a method of manufacturing a former from a resilient material and disposing a conductor around the former. However, as discussed above, McGaffigan does not disclose a hard-wire electrical conductor, so that claim 12 is novel over McGaffigan. Furthermore, claim 12 again relates to a method of manufacturing a coil for a magnet and, as discussed above, McGaffigan does not disclose this.

For at least the foregoing reasons, it is respectfully requested that the rejection of claims 1 and 12 be withdrawn and that the claims be allowed. Also, claims 2-6 and claims 13-16, which depend either directly or indirectly from claims 2 or 12, should also be allowed for at least the same reasons.

Claim Rejections - 35 USC 103

Claims 4, 6, 14 and 16 have been rejected under 35 USC 103(a) as being unpatentable over McGaffigan in view of Kiekhafer (U.S. Patent No. 4,934,049). With regard to this rejection, there is no suggestion in McGaffigan of bending the former into a curved shape before the step of winding the braid around the former. Indeed, it would be extremely difficult, if not impossible, to wind the braid into the horseshoe-shaped winding shown in Figure 13 of McGaffigan after the former has been bent.

The Examiner contends that McGaffigan, in combination with Kiekhafer (U.S. Patent No. 4,934,049), renders claims 4, 6, 14 and 16 obvious. In particular, the Examiner contends that Kiekhafer teaches the concept of manufacturing a former of a rubber material using "injection molding ... which forms grooves in the rubber material to secure and stabilize a coil of hard wire conductors 12." For at least the reasons that follow, the Examiner's contention appears to be incorrect.

Kiekhafer relates to a method of manufacturing a medical electrode. It does not disclose a method of manufacturing a magnet.

The electrode has a central body 28, referred to as the "lead body." This is an electrically insulating body, which contains a conductor coil 36. An electrode 12 which is in the form of a solenoid coil is then slid around the body 28 as shown in Figure 1.

Since the coil 12 is positioned on the body 28 by sliding it into position, it is not clear that any part of the electrode acts as a "former." The coil 12 is presumably made by winding a conductor around a cylindrical former, after which the electrode is then slid over the body 28. However, Kiekhafer is completely silent as to how the coil 12 is wound, or as to the nature of the former used in the winding of the coil 12.

The term "former" means, in its broadest sense, a component that is used to form another component into its desired shape. Thus, a magnet coil is wound around a former to ensure that the coil has the correct dimensions, coil spacing, etc. It is, however, clear from the description of Kiekhafer that the coil 12 is manufactured and shaped away from the body 28. Thus, no part of the electrode acts as a "former" as far as the electrode coil 12 is concerned.

Once the electrode 12 has been slid into position around the body 28, a heat-shrinkable plastic sleeve is disposed outside the electrode, and silicone rubber is then injected between the lead body 28 and the plastic sleeve. This produces the layer 34 shown in Figure 2, which is subsequently partially eroded to expose the electrode 12 as shown in Figure 3.

The Examiner appears to be identifying the step of injecting silicone into the annular space between the lead body 28 and the heat-shrinkable plastic sleeve as the molding step of claim 4. This is incorrect, since the injection step of Kiekhafer will produce an **annular** body 34 that surrounds the central lead body 28. Claim 4, in contrast, refers specifically to forming a flat or substantially flat former by molding. The annular body 34 is clearly not formed as a flat or substantially flat body and then bent into a curved shape. It is molded as an annular body in a single operation.

It is clear that the annular body 34 plays no part in shaping the electrode coil 12, since the coil is wound before the annular body 34 is formed. The coil 12 is wound in a separate step, and is then positioned over the body 28 by sliding it into position. The annular body 34 is molded **after** the electrode coil 12 has been placed into position.

The annular body 34 therefore does not act as a former for the electrode coil. It simply serves to stabilize the electrode coil 34 when the device is in use.

As noted above, the lead body 28 also does not act as a former for the electrode coil 12, since the electrode coil is manufactured separately and the finished coil is slid into place around the lead body. However, even supposing that the body 28 could be considered a "former" for the electrode coil, claim 4 requires the step of forming a flat or substantially flat former by molding, and bending the flat shape former into a curved shape. There is no disclosure in Kiekhafer that the body 28 of the electrode is formed by bending flat sheet into a curved shape. On the contrary, it is described as an "elongated plastic tube of silicone rubber, polyurethane, or other flexible biocompatible material" – see column 2, lines 15-17 – and so will presumably be formed by some form of extrusion process.

With regard to claim 6, this requires that a flat former having a groove is formed by molding, the former is then bent into a curved shape, and a conductor is wound into the groove. This is not disclosed in Kiekhafer. The conductor 12 of Kiekhafer is disposed in position, and the material 34 is then injected around the conductor. This is not a disclosure of the steps of molding a groove in a former and winding a conductor into the former.

For at least the foregoing reasons, it is respectfully requested that the rejection of claims 4, 6, 14 and 16 be withdrawn and that the claims be allowed.

Conclusion

The claims are believed to be allowable and the application is believed to be in condition for allowance. Prompt indication of same is earnestly solicited. If the Examiner does not believe that the above amendments place the application in condition for allowance, the Examiner is respectfully requested to telephone the undersigned to resolve any outstanding issues.

Should a petition for an Extension of Time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary) petition is hereby made and the Commissioner is authorized to

charge any fees (including additional claim fees) to Deposit Account No. 18-0988 under Attorney Docket No. MARSP0114US.

Respectfully submitted,

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